

## **Chapter 2.6 INDIVIDUAL RIVER BASIN DESCRIPTIONS and ASSESSMENTS**

### **Potomac and Shenandoah River Basin**

The Potomac-Shenandoah River Basin, as its name implies, is made up of the Shenandoah River Subbasin and the Potomac River Subbasin. It occupies the northern portion of Virginia and covers 5,747 square miles or 14 percent of the Commonwealth's total area.

In Virginia, the Potomac-Shenandoah basin is defined by both hydrologic and political boundaries. The basin is bounded by the James River, Rappahannock River, and York River Basins to the west and south. The northern and eastern perimeter of the basin is bounded by the West Virginia and Maryland State lines and the District of Columbia.

The Shenandoah River Subbasin headwaters begin in Augusta County and flow in a northeasterly direction for approximately 100 miles to the West Virginia State line. The basin averages 30 miles in width and covers 2,926 square miles.

The topography of the Shenandoah River Subbasin is characterized by rolling hills and valleys bordered by the Appalachian Mountains to the west and the Blue Ridge Mountains to the east. The Massanutten Mountain Range divides the Shenandoah River into the North and South Forks. Tributaries of the Shenandoah River exhibit steep profiles as they drain the surrounding mountain ridge. The main stems of the Shenandoah exhibit a moderately sloping profile with occasional riffles and pools. 45 percent of the land is forested due to the large amount of federally owned land and the steep topography. Farmland and pasture account for 39 percent of the land area, while 16 percent is urban.

The Potomac River Subbasin headwaters begin in Highland County. The drainage area is 323 square miles for the headwaters. The river then flows in a northeasterly direction through West Virginia and Maryland before joining the Shenandoah at Harper's Ferry, West Virginia. The Potomac continues as the border between Maryland and Virginia, flowing in a southeasterly direction to the Chesapeake Bay 200 miles away. The Potomac River Subbasin ranges in width from 40 miles at its northern locations in Loudoun and Fauquier Counties to less than one mile in Westmoreland County. Approximately 2,821 of the 14,700 square miles of the Potomac River Subbasin drainage area lie in Virginia. The rest covers four states and the District of Columbia.

The topography of the upper Piedmont region of the Potomac River Subbasin is characterized by gently sloping hills and valleys from Harpers Ferry to about 45 miles down river. In the central Piedmont area, the profile is rather flat until it nears the fall line at Great Falls, where the stream elevation rapidly descends from over 200 feet, to sea level. Tributaries in the central Piedmont exhibit moderate and near constant profiles. Streams in the Coastal Plain area are largely characterized by their flat slope. Approximately 40 percent of the Potomac River Basin is forested, 33 percent is farmland and pasture and an estimated 27 percent is urban.

The 1994 population for the Potomac-Shenandoah River Basin was approximately 1,973,736. The majority of the population resides in urban Virginia surrounding Washington, D.C. All or part of the following jurisdictions lie within the basin: counties - Augusta, Clarke, Frederick, Page, Rockingham, Shenandoah, Stafford, Warren, Highland, Arlington, Fairfax, Loudoun, Prince William, King George, Northumberland, and Westmoreland; cities - Alexandria, Fairfax, Falls Church, Harrisonburg, Staunton, Waynesboro, and Winchester.

#### *Citizen Data in the Shenandoah-Potomac River Basin*

The Shenandoah-Potomac River Basin has several active citizen groups collecting and analyzing both chemical and biological (benthic macroinvertebrates) data. Chemical data in the Shenandoah River Basin is collected by the following groups: Friends of the Shenandoah, Friends of the North Fork of the

Shenandoah, Opequon Watershed, Friends of the North River, Page County monitors, Augusta County monitors, James Madison University, and the Verona office of the Department of Game and Inland Fisheries.

Together, these organizations collect samples at 160 sites throughout the Shenandoah Valley every two weeks (more than 7500 observations). These samples are analyzed for the conventional parameters of pH and dissolved oxygen (for which there are water quality standards) and are also analyzed for turbidity, nitrogen, phosphorus, and ammonia (for which there are no ambient water quality standards). This data is not included in Appendix B due to quality assurance issues, but in general, measures of dissolved oxygen and pH in ambient waters indicate few areas of concern (for these two parameters) over the past five years.

Another organization active both in the Shenandoah-Potomac River Basin is the Virginia Save Our Streams Program, VA-SOS (a program of the Virginia Chapter of the Izaak Walton League of America). Affiliate organizations include Friends of the North River, Friends of Page Valley and the Northern Virginia Soil and Water Conservation District. Certified VA-SOS volunteers in this basin, monitored twenty-one sites for benthic macroinvertebrates. This data is included in Appendix B of this report and are included in the supporting use analysis in this section. Data from uncertified volunteers was also reviewed and summarized here. In the Potomac Basin, one hundred and fifty observations by uncertified monitors at 42 sites were obtained during this reporting period. Sixteen of the 42 sites consistently rate as fair or poor for supporting benthic macroinvertebrates. The citizen monitoring groups in these areas will be encouraged to continue monitoring at these sites with certified volunteers. In the Shenandoah Basin all reported data is from certified citizen volunteers. As stated above, this data can be found in Appendix B and are included in the supporting use analysis in this section.

Finally, the Alliance for the Chesapeake Bay has two sites in the estuarine portion of the Potomac River Basin. These sites are monitored for pH, dissolved oxygen, temperature, and salinity. The data for these sites can be found in Appendix B of this report.

The Potomac-Shenandoah River Basin is divided into eight USGS hydrologic units as follows: HUC 02070001-South Branch Potomac; HUC 02070004-Conococheague-Opequon; HUC 02070005-South Fork Shenandoah; HUC 02070006-North Fork Shenandoah; HUC 02070007-Shenandoah; HUC 02070008-Upper Middle Potomac; HUC 02070010-Lower Middle Potomac; and HUC 02070011-Lower Potomac. The eight hydrologic units are further divided into 87 waterbodies or watersheds.

Basin assessment information is included in Tables 2.6-1-1, 2.6-1-2, 2.6-1-3.

***It should be noted that the overall river miles, estuarine square miles and lake acres assessment results can be different between the two methods presented in this report. The reason for this has to do with a change in the assessment guidance between the percent method and the binomial method. A decision was made not to assess a data set with only one sample when using the binomial assessment. This decision had an impact especially on lakes being sampled for the first time using the new "pilot" assessment program for lakes, which DEQ has just initiated. Also, mileages for other "special study" stations with only one sample were affected when using the binomial assessment method.***

TABLE 2.6-1-1-A

POTOMAC-SHENANDOAH RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

**Total Size Monitored:**

Rivers – 1557.28 miles

Lakes – 4,208 acres

Estuaries – 34.98 sq. miles

**Basin Size**

Rivers -5,601miles

Lakes - 4,208acres

Estuaries - 62 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1153.89	205.80	296.96	52.53	1712.72
	Lakes (acres)	4117.70	0	0	0	4117.70
	Estuary (mi <sup>2</sup> )	21.26	5.14	1.55	5.72	33.03
<b>Fishing</b>	River (mi)	5439.62	0	141.97	0	5581.59
	Lakes (acres)	4208.70	0	0	0	4208.70
	Estuary (mi <sup>2</sup> )	58.98	0	0	0	58.98
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	25.99	0.10	7.96	0	34.05
<b>Swimming</b>	River (mi)	720.63	0	404.84	328.80	1454.27
	Lakes (acres)	4061.70	0	0	0	4016.70
	Estuary (mi <sup>2</sup> )	24.09	0	0.93	0.04	34.05
<b>Drinking Water</b>	River (mi)	148.01	0	2.15	0	150.16
	Lakes (acres)	3760.40	0	0	0	3760.40
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	2074.27	0	0	2074.27
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	0	0	0	0
<b>Nutrient Enriched</b>	River (mi)	0	0	0	0	0
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	16.65	0	0	16.65

TABLE 2.6-1-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN POTOMAC-SHENANDOAH BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthics)</b>	River (mi)	255.28
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PCB's</b>	River (mi)	43.86
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	108.75
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	19.65
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.45
<b>Ammonia</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.90
<b>Organic Enrichment/Low D.O.</b>	River (mi)	8.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	5.92
<b>Temperature</b>	River (mi)	67.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	733.64
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	8.09
<b>Flow Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Other Inorganics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.64
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-1-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN POTOMAC-SHENANDOAH BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	14.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	6.83
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	343.71
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	62.08
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources (Stratification)</b>	River (mi)	84.35
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	5.72
<b>Source Unknown</b>	River (mi)	417.61
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.64
<b>Nonpoint Sources</b>	River (mi)	9.74
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	141.97
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Collection System Failure</b>	River (mi)	4.37
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	7.96

TABLE 2.6-1-1-B

POTOMAC-SHENANDOAH RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

**BINOMIAL METHOD****Total Size Monitored:**

Rivers – 1557.28 miles

Lakes – 4,208 acres

Estuaries – 34.98 sq. miles

**Basin Size**

Rivers -5,601miles

Lakes - 4,208acres

Estuaries - 62 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1146.39	167.77	282.95	52.53	1649.64
	Lakes (acres)	2136.30	0	0	0	2136.30
	Estuary (mi <sup>2</sup> )	24.14	4.95	3.35	3.47	35.91
<b>Fishing</b>	River (mi)	5423.84	19.32	141.97	0	5585.13
	Lakes (acres)	2136.30	0	0	0	2136.30
	Estuary (mi <sup>2</sup> )	58.95	0	0	0	58.95
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	25.99	0.10	7.96	0	34.05
<b>Swimming</b>	River (mi)	714.55	80.17	387.73	256.11	1438.56
	Lakes (acres)	1989.30	0	0	0	1989.30
	Estuary (mi <sup>2</sup> )	24.09	0.64	0.29	0.04	25.06
<b>Drinking Water</b>	River (mi)	148.01	0	2.15	0	150.16
	Lakes (acres)	1856.00	0	0	0	1856.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	2074.27	0	0	2074.27
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	16.65	0	0	16.65
<b>Nutrient Enriched</b>	River (mi)	0	0	0	0	0
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	0	0	0	0

TABLE 2.6-1-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN POTOMAC-SHENANDOAH BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthics)</b>	River (mi)	255.28
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PCB's</b>	River (mi)	43.86
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	98.11
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	12.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Ammonia</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.90
<b>Organic Enrichment/Low D.O.</b>	River (mi)	8.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	64.54
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	643.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	8.09
<b>Nitrates</b>	River (mi)	2.15
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Non-Priority Organics</b>	River (mi)	15.78
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-1-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN POTOMAC-SHENANDOAH BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	14.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	6.83
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	343.71
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	62.08
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources (Stratification)</b>	River (mi)	81.49
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	5.72
<b>Source Unknown</b>	River (mi)	344.91
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.19
<b>Nonpoint Sources</b>	River (mi)	9.74
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	141.97
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Collection System Failure</b>	River (mi)	4.37
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	7.96



## **James River Basin**

The James River Basin occupies the central portion of Virginia and covers 10,206 square miles or approximately 25 percent of the Commonwealth's total land area. It is Virginia's largest river basin and is made up of the Upper, Middle, and Lower James River Subbasins; and the Appomattox River Subbasin.

The James River Basin is defined by both hydrologic and political boundaries. The basin is bounded by the Potomac-Shenandoah River Basin, the Rappahannock River Basin and the York River Basins to the north. The southern boundary is made up of the New River Basin, the Roanoke River Basin and the Chowan River Basin. Its headwaters originate along the Virginia/West Virginia state line.

The James River Basin begins in the Alleghany Mountains and flows in a southeasterly direction to Hampton Roads where it enters the Chesapeake Bay. The James is formed by the confluence of the Jackson and Cowpasture Rivers and flows 228 miles to the Fall Line at Richmond and another 111 miles to the Chesapeake Bay.

The topography of the James River Basin varies throughout the four physiographic provinces that it spans. The Valley and Ridge Province extends from the Appalachian Plateau in West Virginia to the Blue Ridge Province. This province is dominated by narrow ridges and valleys running in a northeast/southwest direction, turning into a broad valley with low, rounded hills in the extreme southeast section of the province. The Blue Ridge Province, a remnant of a former highland, differs from the Valley and Ridge Province in rock types and geological structure. The Piedmont Province extends from the Blue Ridge Province to the Fall Line. The western section of the Piedmont has scattered hills and small mountains, gradually turning into gently rolling slopes and lower elevation in the eastern Piedmont Province. The Coastal Plain Province is separated from the Piedmont by the Fall Zone. The Fall Zone is a three-mile stretch of river running through Richmond where the river descends 84 feet as it flows from the resistant rocks of the Piedmont to the softer sediments of the Coastal Plain.

Over 65 percent of the James River Basin is forested, with 19 percent in cropland and pasture. Approximately 12 percent is considered urban. The 1994 population for the James River Basin was approximately 1,909,511. This population is concentrated in two metropolitan areas: Tidewater, with over one million people, and the Greater Richmond - Petersburg area with over 750,000. Two smaller population centers are the Lynchburg and Charlottesville areas, each with over 100,000 people. All or portions of the following 39 counties and 14 cities lie within the basin: counties - Alleghany, Amherst, Bath, Nelson, Rockbridge, Augusta, Bedford, Botetourt, Campbell, Craig, Giles, Highland, Montgomery, Roanoke, Amelia, Buckingham, Chesterfield, Cumberland, Fluvanna, Goochland, Henrico, Powhatan, Albemarle, Appomattox, Prince Edward, Dinwiddie, Greene, Hanover, Louisa, Nottoway, Orange, Charles City, Isle of Wight, James City, Nansemond, New Kent, Prince George, Surry, and York; cities - Buena Vista, Clifton Forge, Covington, Lexington, Lynchburg, Charlottesville, Colonial Heights, Petersburg, Richmond, Hopewell, Norfolk, Newport News, Suffolk and Williamsburg.

Average annual precipitation is 42.5 inches. Average annual snowfall amounts range from over 30 inches in the mountains to less than 10 inches along the coast.

Major tributaries to the James River are Craig Creek, Maury River, Tye River, Rockfish River, Slate River, Rivanna River, Willis Creek, Appomattox River, Chickahominy River, Pagan River, Nansemond River, and the Elizabeth River.

### *Citizen Data in the James River Basin*

The Alliance for the Chesapeake Bay has 15 sites in the James River Basin. These sites are monitored for pH, dissolved oxygen, temperature, and salinity. The data for these sites can be found in Appendix B and is included in the supporting use matrix in this section.

The Virginia Save Our Streams program (a program of the Virginia Chapter of the Izaak Walton League of America) has 13 sites in the James River watershed. Sixteen observations were taken at these sites by certified VA-SOS volunteers. Affiliate VA-SOS organizations in the James River watershed include the Environmental Education Center, ECCO/Bath County Monitors, Maury River Watershed Alliance,

Buckingham Citizens Action League. This data is included in Appendix B of this report.

The James River Basin is divided into seven USGS hydrologic units as follows: HUC 02080201 -Upper James, HUC 02080202 - the Maury, HUC 02080203 - Upper Middle James, HUC 02080204 - the Rivanna, HUC 02080205 - Lower Middle James, HUC 02080206 - Lower James, and HUC 02080207 - the Appomattox, and HUC 02080208 - the Elizabeth. The nine hydrologic units are further divided into 92 waterbodies or watersheds.

Basin assessment information is presented in Tables 2.6-2-1, 2.6-2-2, 2.6-2-3.

TABLE 2.6-2-1-A

## JAMES RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

**Total Size Monitored:**

Rivers – 2604.92 miles

Lakes - 18,937.20 acres

Estuaries – 263.49 sq. miles

**Basin Size**

Rivers -12,822 miles

Lakes - 20,854 acres

Estuaries -264 sq. Miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	2869.64	269.56	162.72	189.98	3491.90
	Lakes (acres)	12670.40	5736.00	0	125.00	18531.40
	Estuary (mi <sup>2</sup> )	199.89	9.40	46.23	7.97	263.49
<b>Fishing</b>	River (mi)	12704.58	9.84	0	0	12714.42
	Lakes (acres)	18833.20	0	0	0	18833.20
	Estuary (mi <sup>2</sup> )	237.22	26.27	64.19	0	263.49
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	92.59	0	54.86	23.65	171.10
<b>Swimming</b>	River (mi)	1368.63	0	418.37	214.55	2001.55
	Lakes (acres)	9033.40	0	0	0	9033.40
	Estuary (mi <sup>2</sup> )	217.03	0	15.24	12.30	244.57
<b>Drinking Water</b>	River (mi)	1232.83	0	2.15	0	1232.83
	Lakes (acres)	14090.60	0	0	0	14090.60
	Estuary (mi <sup>2</sup> )	8.72	0	0	0	8.72
<b>DCR-High Priority</b>	River (mi)	0	2112.43	0	0	3154.20
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	196.61	0	0	196.61
<b>Nutrient Enriched</b>	River (mi)	0	1904.18	0	0	1904.18
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	259.30	0	0	259.30

TABLE 2.6-2-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN JAMES BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthics)</b>	River (mi)	68.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	36.43
<b>Unknown Toxicity</b>	River (mi)	2.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Non-Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.00
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	64.29
<b>Priority Organics (TBT)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.20
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.60
<b>PH</b>	River (mi)	95.05
	Lakes (acres)	125.00
	Estuary (mi <sup>2</sup> )	1.51
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	167.58
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	2.27
<b>Temperature</b>	River (mi)	83.36
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	632.92
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	103.67
<b>PCB-s</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.0
<b>Ammonia</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-2-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN JAMES BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	56.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	4.50
<b>Municipal Point Sources</b>	River (mi)	4.85
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	27.18
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	163.54
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	74.59
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	12.75
<b>Commercial Port Activity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.30
<b>Habitat Modification (Road Construction)</b>	River (mi)	1.16
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Upstream Impoundment (Hydromodification)</b>	River (mi)	1.99
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	132.58
	Lakes (acres)	125.00
	Estuary (mi <sup>2</sup> )	1.95
<b>Source Unknown</b>	River (mi)	369.34
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	34.61
<b>Point/Nonpoint Source</b>	River (mi)	22.30
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.11
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	78.51

TABLE 2.6-2-1-B

## JAMES RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## BINOMIAL METHOD

**Total Size Monitored:**

Rivers – 2490.97 miles

Lakes - 10,883.20 acres

Estuaries – 264.00 sq. miles

**Basin Size**

Rivers -12,822 miles

Lakes - 20,854 acres

Estuaries -264 sq. Miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1904.81	204.76	214.90	114.96	2439.43
	Lakes (acres)	10114.90	2430.00	0	0	12544.90
	Estuary (mi <sup>2</sup> )	195.81	12.96	45.33	7.68	261.78
<b>Fishing</b>	River (mi)	12662.00	9.84	0	0	12671.84
	Lakes (acres)	18833.20	0	0	0	18833.20
	Estuary (mi <sup>2</sup> )	261.58	1.26	0	0	262.84
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	92.59	0	54.86	23.65	171.10
<b>Swimming</b>	River (mi)	1370.94	216.43	289.85	126.63	2003.85
	Lakes (acres)	8549.90	0	0	0	8549.90
	Estuary (mi <sup>2</sup> )	217.03	0.77	15.41	10.71	243.92
<b>Drinking Water</b>	River (mi)	1232.83	0	0	0	1232.83
	Lakes (acres)	14090.60	0	0	0	14090.60
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	2114.02	0	0	2114.02
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	196.61	0	0	196.61
<b>Nutrient Enriched</b>	River (mi)	0	1910.54	0	0	1910.54
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	259.30	0	0	259.30

TABLE 2.6-2-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN JAMES BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthics)</b>	River (mi)	68.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	36.43
<b>Unknown Toxicity</b>	River (mi)	2.45
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Non-Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics (TBT)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.20
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.60
<b>PH</b>	River (mi)	81.03
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.51
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	155.79
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.08
<b>Temperature</b>	River (mi)	73.66
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	411.48
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	102.90
<b>PCB=s</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3.00
<b>Ammonia</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-2-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN JAMES BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	46.88
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	4.50
<b>Municipal Point Sources</b>	River (mi)	2.16
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	27.17
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	147.76
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Marinas</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.11
<b>Urban Runoff/Storm Sewers</b>	River (mi)	58.72
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	12.06
<b>Commercial Port Activity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.30
<b>Habitat Modification (Road Construction)</b>	River (mi)	1.16
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Upstream Impoundment (Hydromodification)</b>	River (mi)	1.99
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	120.72
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.20
<b>Source Unknown</b>	River (mi)	240.26
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	50.47
<b>Point/Nonpoint Source</b>	River (mi)	15.90
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	78.51



## **Rappahannock River Basin**

The Rappahannock River Basin is located in the northeastern portion of Virginia and covers 2,715 square miles or approximately 6.8 percent of the Commonwealth's total area.

The Rappahannock River Basin is bordered by the Potomac-Shenandoah Basin to the north and the York River Basin and Coastal Basin to the south. The headwaters lie in Fauquier and Rappahannock Counties and flow in a southeasterly direction to its mouth, where it enters the Chesapeake Bay between Lancaster and Middlesex Counties. The Rappahannock River Basin is 184 miles in length and varies in width from 20 to 50 miles.

The Rappahannock River Basin's major tributaries are the Hazel River, Thornton River, Mountain Run, Rapidan River, Robinson River, Cat Point Creek, and the Corotoman River.

The topography of the Rappahannock River Basin changes from steep to flat as it flows from the Blue Ridge Mountains to the Chesapeake Bay. About 51 percent of the basin land is forest, while pasture and cropland make up another 36 percent. Only about 6 percent of the land area is considered urban.

Most of the Rappahannock River Basin lies in the eastern Piedmont and Tidewater areas of the Commonwealth while its headwaters, located on the eastern slopes of the Blue Ridge, are considered to be in the northern and western Piedmont section.

The population for the Rappahannock River Basin was approximately 185,574 in 1994. The basin is mostly rural in character with no large population centers, however, the influence of metropolitan Washington is beginning to be felt in the Fredericksburg and Fauquier areas of the basin. All or portions of the following 18 counties lie within the Basin: Albemarle, Caroline, Culpeper, Essex, Fauquier, Gloucester, Greene, King and Queen, King George, Lancaster, Madison, Middlesex, Orange, Rappahannock, Richmond, Spotsylvania, Stafford and Westmoreland.

### *Citizen Data in the Rappahannock River Basin*

Citizen monitors in this part of the Commonwealth measure both chemical and biologic parameters. The Alliance for the Chesapeake Bay has 18 sites in the Rappahannock River Basin. These sites are monitored for pH, dissolved oxygen, temperature, and salinity. The data for these sites can be found in Appendix B and is included in the supporting use matrix for this river basin.

Another organization active in the Rappahannock River Basin is the Virginia Save Our Streams Program (a program of the Virginia Chapter of the Izaak Walton League of America). Certified VA-SOS monitors in this basin monitored three sites a total of 17 events. This data is included in Appendix B of this report and are included in the supporting use matrix in this section.

The Rappahannock River Basin is divided into two USGS hydrologic units as follows: HUC 02080103 - Rapidan-Upper Rappahannock; and HUC 02080104 - Lower Rappahannock.

Basin assessment information is presented in Tables 2.6-3-1, 2.6-3-2, 2.6-3-3.

TABLE 2.6-3-1-A

## RAPPAHANNOCK RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

**Total Size Monitored:**

Rivers – 262.70 miles

Lakes - 567.50 acres

Estuaries - 156.03 sq. miles

**Basin Size**

Rivers - 2,676miles

Lakes - 651acres

Estuaries -167 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	352.42	67.11	6.89	7.82	434.24
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	19.09	0.27	129.02	0.78	149.16
<b>Fishing</b>	River (mi)	2676.43	0	0	0	2676.43
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	163.52	3.91	0	0	167.43
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	125.30	0.50	11.66	0	137.46
<b>Swimming</b>	River (mi)	99.51	0	77.82	29.18	206.51
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	143.04	0	2.22	0.28	145.54
<b>Drinking Water</b>	River (mi)	0	0	0	0	0
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	913.27	0	0	913.27
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	6.02	0	0	6.02
<b>Nutrient Enriched</b>	River (mi)	0	568.97	0	0	568.97
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	142.21	0	0	142.21



TABLE 2.6-3-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN RAPPAHANNOCK BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	122.59
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	14.71
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	3.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.30
<b>Thermal Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	107.00
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	12.29
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-3-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN RAPPAHANNOCK BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.28
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.27
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Construction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	14.71
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	107.00
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	80.74
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	10.72

TABLE 2.6-3-1-B

RAPPAHANNOCK RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

**BINOMIAL METHOD****Total Size Monitored:**

Rivers – 262.70 miles

Lakes - 567.50 acres

Estuaries - 156.03 sq. miles

**Basin Size**

Rivers - 2,676miles

Lakes - 651acres

Estuaries -167 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	314.86	16.99	7.90	4.00	343.75
	Lakes (acres)	340.70	0	0	0	340.70
	Estuary (mi <sup>2</sup> )	16.61	0.49	133.27	0.78	151.15
<b>Fishing</b>	River (mi)	2676.43	0	0	0	2676.43
	Lakes (acres)	340.70	0	0	0	340.70
	Estuary (mi <sup>2</sup> )	167.43	0	0	0	167.43
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	124.75	0.50	11.72	0	136.97
<b>Swimming</b>	River (mi)	97.25	30.66	58.50	17.84	204.25
	Lakes (acres)	340.70	0	0	0	340.70
	Estuary (mi <sup>2</sup> )	143.04	1.89	0.61	0	145.54
<b>Drinking Water</b>	River (mi)	0	0	0	0	0
	Lakes (acres)	253.50	0	0	0	253.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	913.27	0	0	913.27
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	6.02	0	0	6.02
<b>Nutrient Enriched</b>	River (mi)	0	568.97	0	0	568.97
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	142.21	0	0	142.21



TABLE 2.6-3-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN RAPPAHANNOCK BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	127.14
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	11.90
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	3.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Thermal Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	76.34
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	10.80
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0



TABLE 2.6-3-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN RAPPAHANNOCK BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.28
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.27
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Construction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	11.90
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	76.34
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	85.05
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	10.60

## **Roanoke River Basin**

The Roanoke River Basin covers 6,382 square miles or approximately 16 percent of the Commonwealth's total area. In addition to the Roanoke itself, the basin also contains the Ararat River Subbasin.

The Virginia portion of the Roanoke River Basin is defined by both hydrologic and political boundaries. The basin is bounded to the north by the James River Basin, on the east by the Chowan River Basin, and to the west by the New River Basin. The southern boundary of the basin is the Virginia/North Carolina State line.

The topography of the Roanoke River Basin ranges from steep slopes and valleys in the Valley and Ridge Province to gently sloping terrain east of the mountains in the Piedmont Province.

The Roanoke River Basin headwaters begin in the mountainous terrain of eastern Montgomery County and flow in a southeasterly direction to the Virginia/North Carolina state line. The Roanoke Basin passes through three physiographic provinces, the Valley and Ridge Province to the northwest, and the Blue Ridge and Piedmont Provinces to the southeast.

The Roanoke watershed is large enough to accommodate two major reservoirs, Smith Mountain and Leesville Lakes to the north, and Kerr Reservoir and Lake Gaston located at the junction of the Roanoke River and the North Carolina state line. These reservoirs range in size from the 49,000 acre Kerr Reservoir to the 3,400 acre Leesville Lake. These impoundments are used for both recreation and hydroelectricity. Major tributaries in the northern section of the basin are the Little Otter and Big Otter Rivers along with the Blackwater and Pigg Rivers. Major tributaries in the southern portion include the Dan River, Smith River, and Banister River.

Over 62 percent of the Roanoke River Basin is forested, while nearly 25 percent is in cropland and pasture. Approximately 10 percent is considered urban.

The 1994 population for the Roanoke River Basin was approximately 669,681. All or portions of the following sixteen counties and six cities lie within the basin: counties - Patrick, Henry, Pittsylvania, Halifax, Franklin, Mecklenburg, Roanoke, Bedford, Campbell, Charlotte, Carroll, Brunswick, Montgomery, Botetourt, Floyd, and Appomattox; cities - Roanoke, Salem, Martinsville, Danville, Bedford, and South Boston.

### *Citizen Data in the Roanoke River Basin*

The Virginia Save Our Streams program (a program of the Virginia Chapter of the Izaak Walton League of America) has 4 sites in the Roanoke River watershed. These sites were all monitored by VA-SOS certified volunteers. Affiliate VA-SOS organizations in the Roanoke River watershed include Virginia Tech Museum of Natural History, Blue Ridge Environmental Network and Virginia's Explore Park. This data is included in Appendix B of this report and are included in the supporting use matrix in this section.

While there is an extensive summertime monitoring program at Smith Mountain Lake, this data was not submitted for inclusion in this report. This summertime monitoring program measures temperature, pH, dissolved oxygen, secchi disk, fecal coliform, and chlorophyll a. The Life Sciences Department at Ferrum College organizes this monitoring program.

The Roanoke River Basin is divided into six USGS hydrologic units as follows: HUC 03010101 - Upper Roanoke; HUC 03010102 - Middle Roanoke; HUC 03010103 - Upper Dan; HUC 03010104 - Lower Dan; HUC 03010105 - Banister, and HUC 03010106 - Roanoke Rapids.

Basin assessment information is presented in Tables 2.6-4-1, 2.6-4-2, 2.6-4-3.

TABLE 2.6-4-1-A

## ROANOKE RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

**Total Size Monitored:**

Rivers- 1279.17 miles

Lakes - 97,910.40 acres

Estuaries - 0 sq. miles

**Basin Size:**

Rivers-9,500 miles

Lakes - 97,910 acres

Estuaries -0 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	977.87	169.92	95.60	25.30	1268.69
	Lakes (acres)	87044.00	6706.80	2261.20	1388.80	97400.80
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Fishing</b>	River (mi)	9341.03	36.53	126.73	0	9504.29
	Lakes (acres)	28642.40	69268.00	0	0	97910.40
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	272.14	0	423.04	391.28	1086.46
	Lakes (acres)	97059.80	0	0	105.00	97164.80
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Drinking Water</b>	River (mi)	3478.94	0	0	0	3478.94
	Lakes (acres)	90631.00	0	0	0	90631.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	1921.81	0	0	1921.81
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Nutrient Enriched</b>	River (mi)	0	701.38	0	0	701.38
	Lakes (acres)	0	0	0	0	0

	Estuary (mi <sup>2</sup> )	-	-	-	-	-
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TABLE 2.6-4-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN ROANOKE BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	66.95
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Non Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics (PCB-s)</b>	River (mi)	126.73
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	0
	Lakes (acres)	3650.00
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	4003.00
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	9.46
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	44.49
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	795.36
	Lakes (acres)	105.00
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-4-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN ROANOKE BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	41.71
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	445.36
	Lakes (acres)	105.00
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Construction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	297.09
	Lakes (acres)	105.00
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	44.49
	Lakes (acres)	3650.00
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	214.70
	Lakes (acres)	4003.00
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	126.73
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Hydromodification</b>	River (mi)	9.46
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-4-1-B

## ROANOKE RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## BINOMIAL METHOD

**Total Size Monitored:**

Rivers– 1277.41 miles

Lakes – 96,026.80 acres

Estuaries - 0 sq. miles

**Basin Size:**

Rivers-9,500 miles

Lakes - 97,910 acres

Estuaries -0 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	852.32	184.88	86.57	18.41	1142.18
	Lakes (acres)	66431.00	8518.00	450.00	1388.80	76787.80
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Fishing</b>	River (mi)	9341.03	36.53	126.73	0	9504.29
	Lakes (acres)	28519.40	69268.00	0	0	97787.40
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	261.50	220.79	264.72	329.05	1076.06
	Lakes (acres)	76522.80	0	0	105.00	76657.80
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Drinking Water</b>	River (mi)	3478.94	0	0	0	3478.94
	Lakes (acres)	90631.00	0	0	0	90631.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	1928.45	0	0	1928.45
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Nutrient Enriched</b>	River (mi)	0	701.38	0	0	701.38
	Lakes (acres)	0	0	0	0	0

	Estuary (mi <sup>2</sup> )	-	-	-	-	-
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TABLE 2.6-4-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN ROANOKE BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	66.95
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Non Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics (PCB-s)</b>	River (mi)	126.73
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	0
	Lakes (acres)	1838.80
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	4003.00
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	9.46
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	28.57
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	574.81
	Lakes (acres)	105.00
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-4-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN ROANOKE BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	41.71
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	299.98
	Lakes (acres)	105.00*
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Construction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	240.97
	Lakes (acres)	105.00*
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	18.76
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	193.17
	Lakes (acres)	4003.00
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	126.73
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Hydromodification</b>	River (mi)	9.46
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

\* = two different sources for the same not meeting designated use water

## **Chowan River-Dismal Swamp Basin**

The Chowan River and Dismal Swamp Basin is located in the southeastern portion of Virginia and covers 4,061 square miles or approximately 10 percent of the Commonwealth's total area.

The Basin extends eastward from Charlotte County to the Chesapeake Bay. The Chowan River-Dismal Swamp Basin in Virginia is defined by both hydrologic and political boundaries. The basin is bordered by the James River Basin and the Small Coastal River Basins to the east, the Roanoke River Basin to the west and the Virginia/North Carolina State line to the south. The basin is approximately 145 miles in length and varies from 10 to 50 miles in width. The Chowan River-Dismal Swamp Basin flows through the Piedmont and Coastal Plain Physiographic Provinces. The Chowan portion flows 130 miles from east to west, crossing both the Piedmont and Coastal Plain, while the Dismal Swamp lies entirely within the Coastal Plain. The Piedmont portion is characterized by rolling hills, steeper slopes and somewhat more pronounced stream valleys. The Coastal Plain, in contrast, is nearly flat with a descending series of terraces.

The Chowan River-Dismal Swamp Basin is mostly rural with approximately 64 percent of its land covered by forest. Cropland and pasture make up another 28 percent, while only about 6 percent is classified as urban.

The 1994 population for the Chowan River-Dismal Swamp Basin was approximately 586,276. All or portions of the following 14 counties and three cities lie within the basin: Counties - Greenville, Lunenburg, Southampton, Sussex, Brunswick, Charlotte, Dinwiddie, Isle of Wight, Mecklenburg, Nansemond, Nottoway, Prince Edward, and Surry; Cities - Chesapeake, Franklin, Suffolk, and Virginia Beach.

Major tributaries of the Chowan River are the Meherrin, the Nottoway and the Blackwater. The Nottoway and the Blackwater join at the Virginia/North Carolina state line to form the Chowan River. The Dismal Swamp portion is mostly flat with many swamp and marshland areas.

### *Citizen Data in the Chowan-Dismal Swamp River Basin*

No citizen-collected data was submitted to DEQ from this river basin.

The Chowan River-Dismal Swamp Basin is divided into five USGS hydrologic units as follows: HUC 03010201 - Nottoway; HUC 03010202 - Blackwater; HUC 03010203 - Chowan; HUC 03010204 - Meherrin; and HUC 03010205 - Albemarle Sound. The five hydrologic units are further divided into 44 waterbodies or watersheds.

Basin assessment information is presented in Tables 2.6-5-1, 2.6-5-2, 2.6-5-3.

TABLE 2.6-5-1-A

## CHOWAN-DISMAL SWAMP BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

**Total Size Monitored:**

Rivers -1,490.78 miles

Lakes - 609.00 acres

Estuaries - 82.90 sq. miles

**Basin Size**

Rivers -4,906 miles

Lakes - 5,029.30 acres

Estuaries -83 sq miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1262.76	20.06	88.02	647.89	2018.73
	Lakes (acres)	4272.00	0	0	0	4272.00
	Estuary (mi <sup>2</sup> )	0	82.78	0	0.12	82.90
<b>Fishing</b>	River (mi)	4904.27	2.00	0	0	4906.27
	Lakes (acres)	4345.00	0	0	0	4345.00
	Estuary (mi <sup>2</sup> )	82.90	0	0	0	82.90
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	1397.52	0	235.09	49.86	1682.47
	Lakes (acres)	3757.00	0	0	0	3757.00
	Estuary (mi <sup>2</sup> )	82.78	0	0.12	0	82.90
<b>Drinking Water</b>	River (mi)	213.57	0	0	0	213.57
	Lakes (acres)	892.00	0	0	0	892.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	130.00	0	0	130.00
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	0	0	0	0
<b>Nutrient Enriched</b>	River (mi)	0	2064.33	0	0	2064.33
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	0	0	0	0

TABLE 2.6-5-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN CHOWAN-DISMAL SWAMP BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	7.76
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Known Toxicity (Ammonia)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	477.13
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	713.38
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Pathogen Indicators</b>	River (mi)	284.95
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Dioxins</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-5-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN CHOWAN-DISMAL SWAMP BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	12.58
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	3.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	1.23
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Hydromodification</b>	River (mi)	5.74
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Construction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	5.77
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	699.38
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	299.03
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Other/Water Quality Standards</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-5-1-B

## CHOWAN-DISMAL SWAMP BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## BINOMIAL METHOD

**Total Size Monitored:**

Rivers -1,490.78 miles  
 Lakes - 4,345.00 acres  
 Estuaries - 82.90 sq. miles

**Basin Size**

Rivers -4906 miles  
 Lakes - 5,029.30 acres  
 Estuaries -83 sq miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1342.20	22.26	154.15	573.65	2092.26
	Lakes (acres)	3873.00	0	0	0	3873.00
	Estuary (mi <sup>2</sup> )	0	82.78	0.12	0	82.90
<b>Fishing</b>	River (mi)	4904.27	2.00	0	0	4906.27
	Lakes (acres)	4345.00	0	0	0	4345.00
	Estuary (mi <sup>2</sup> )	82.90	0	0	0	82.90
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	1399.92	55.34	196.26	30.95	1682.47
	Lakes (acres)	3663.00	0	0	0	3663.00
	Estuary (mi <sup>2</sup> )	82.78	0	0.12	0	82.90
<b>Drinking Water</b>	River (mi)	213.57	0	0	0	213.57
	Lakes (acres)	892.00	0	0	0	892.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	130.00	0	0	130.00
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	0	0	0	0
<b>Nutrient Enriched</b>	River (mi)	0	2064.33	0	0	2064.33
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	0	0	0	0

TABLE 2.6-5-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN CHOWAN-DISMAL SWAMP BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	7.76
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Known Toxicity (Ammonia)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	474.73
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	705.27
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Pathogen Indicators</b>	River (mi)	227.21
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Dioxins</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0



TABLE 2.6-5-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN CHOWAN-DISMAL SWAMP BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	12.58
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	3.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	1.23
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Hydromodification</b>	River (mi)	5.74
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Construction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	5.77
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	699.38
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Source Unknown</b>	River (mi)	285.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.12
<b>Other/Water Quality Standards</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

## **Tennessee-Big Sandy River Basin**

The segment of the Tennessee and Big Sandy River Basin which lies in Virginia is made up of the Holston, Clinch-Powell, and Big Sandy River Subbasins. These subbasins are located in the extreme southwest portion of Virginia and cover 4,140 square miles or approximately 10.5 percent of the Commonwealth's total land area.

The Virginia portion of the Tennessee-Big Sandy River Basin is defined by both hydrologic and political boundaries. The West Virginia State line lies to the northeast, Kentucky to the west, and Tennessee to the south. The New River Basin makes up the eastern boundary.

While the Tennessee and Big Sandy Rivers are fed by numerous southwest Virginia streams, neither river forms within the Commonwealth itself. The Big Sandy subbasin contains the Levisa and Tug Forks which flow northward into Kentucky forming the Big Sandy River. The Tennessee River is formed in Tennessee by the southwestward flowing Holston, Clinch and Powell tributaries. Both of the major river subbasins eventually empty into the Gulf of Mexico via the Ohio and Mississippi Rivers.

The Tennessee-Big Sandy River Basin spans three physiographic provinces: the Cumberland Plateau, Valley and Ridge, and the Blue Ridge. The Big Sandy portion of the basin lies within the Cumberland Plateau. This province is characterized as rugged, with mountainous terrain and steep valleys. The Tennessee portion, lying in the Valley and Ridge Province, is characterized by parallel valleys and ridges running in a northeast to southwest direction. A small portion, located in the Blue Ridge Province, is more plateau-like, with no single, prominent ridge which characterizes the Ridge and Valley province to the north.

Within Virginia, approximately 48 percent of the Tennessee River Basin is forested, while cropland and pasture make up another 39.7 percent. The Big Sandy portion of the basin is approximately 86 percent forest, with only about 5 percent in cropland and pasture. Urban areas make up only a small percentage of the total land area.

The 1994 population for the Tennessee-Big Sandy River Basin was approximately 310,309, or 5 percent of Virginia's total population. All or part of the following jurisdictions lie within the basin: counties - Lee, Scott, Russell, Washington, Smyth, Tazewell, Buchanan, Dickinson, Bland, Wythe, Grayson and Wise; cities - Norton and Bristol.

### *Citizen Data in the Tennessee-Big Sandy River Basin*

The Virginia Save Our Streams program (a program of the Virginia Chapter of the Izaak Walton League of America) has 1 site in the Tennessee-Big Sandy River watersheds for the time period of this report. Affiliate VA-SOS organizations in the Roanoke River watershed include Virginia Tech Museum of Natural History and Headwaters Association. This data is included in Appendix B of this report.

The Tennessee-Big Sandy River Basin is divided into six USGS hydrologic units as follows: HUC 05070201 - Tug Fork; HUC 05070202 - Upper Levisa; HUC 06010101 - North Fork Holston; HUC 06010102 - South and Middle Fork Holston; HUC 06010205 - Upper Clinch; and HUC 01010206 - Powell River. The six hydrologic units are further divided into 48 waterbodies or watersheds.

Basin assessment information is presented in Tables 2.6-6-1, 2.6-6-2, 2.6-6-3.

TABLE 2.6-6-1-A

## TENNESSEE - BIG SANDY RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY

## PERCENT METHOD

**Total Size Monitored:**

Rivers - 1,371.35 miles

Lakes - 3,844.00 acres

Estuaries -0 sq. miles

**Basin Size**

Rivers- 5,975.61miles

Lakes - 9,491acres

Estuaries -0 sq.miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1377.40	212.03	159.63	82.47	1831.53
	Lakes (acres)	3738.00	0	0	0	3738.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Fishing</b>	River (mi)	5821.09	62.12	12.00	80.40	5975.61
	Lakes (acres)	2034.00	1810.00	0	0	3844.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	372.83	4.68	70.46	120.19	568.16
	Lakes (acres)	3738.00	0	0	0	3738.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Drinking Water</b>	River (mi)	323.01	0	0	0	323.01
	Lakes (acres)	3243.00	0	0	0	3243.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	1387.77	0	0	1387.77
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Nutrient Enriched</b>	River (mi)	0	0	0	0	0
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-

TABLE 2.6-6-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN TENNESSEE-BIG SANDY BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	210.10
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PCB's</b>	River (mi)	12.00
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	80.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	4.07
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	0.74
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	182.10
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	15.11
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-6-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN TENNESSEE-BIG SANDY BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	5.34
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Hydromodification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	52.95
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	5.69
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	169.67
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	127.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	43.51
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	65.66
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification</b>	River (mi)	44.80
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Point/Source/Nonpoint Source</b>	River (mi)	7.32
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	92.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-6-1-B

## TENNESSEE - BIG SANDY RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY

## BINOMIAL METHOD

**Total Size Monitored:**

Rivers - 1,371.35 miles

Lakes - 3,738.00 acres

Estuaries - 0 sq. miles

**Basin Size**

Rivers- 5,975.61miles

Lakes - 9,491acres

Estuaries - 0 sq.miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1377.40	212.03	159.63	82.47	1831.53
	Lakes (acres)	3738.00	0	0	0	3738.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Fishing</b>	River (mi)	5821.09	62.12	12.00	80.40	5975.61
	Lakes (acres)	2034.00	1810.00	0	0	3844.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	358.64	63.80	25.53	120.19	568.16
	Lakes (acres)	3738.00	0	0	0	3738.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Drinking Water</b>	River (mi)	323.01	0	0	0	323.01
	Lakes (acres)	3243.00	0	0	0	3243.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	1387.77	0	0	1387.77
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Nutrient Enriched</b>	River (mi)	0	0	0	0	0
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-







TABLE 2.6-6-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE CATEGORIES  
IN TENNESSEE-BIG SANDY BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	210.10
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PCB's</b>	River (mi)	12.00
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	80.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	4.07
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	0.74
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	145.72
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	15.11
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-6-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN TENNESSEE-BIG SANDY BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	5.34
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Hydromodification</b>	River (mi)	1.08
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	48.35
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	149.92
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	127.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	24.58
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	65.66
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification</b>	River (mi)	44.80
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Point/Source/Nonpoint Source</b>	River (mi)	7.32
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	92.40
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

## **Chesapeake Bay and Small Coastal Basins**

The Chesapeake Bay/Small Coastal Basin is located in the eastern part of Virginia and covers 1,588 square miles or approximately 4 percent of the Commonwealth's total land area. The basin encompasses the small bays, river inlets, islands and shoreline immediately surrounding the Chesapeake Bay and the southern tip of the Delmarva Peninsula. This basin also includes the Chesapeake Bay itself.

The Chesapeake Bay/Coastal Basin is defined by both hydrologic and political boundaries. The basin is bordered by the Potomac River Basin, the Rappahannock River Basin, the York River Basin, the James River Basin, and the Chowan River-Dismal Swamp Basin to its west. The Eastern Shore portion is bordered on the east by the Atlantic Ocean, on the north by Maryland, and on the west and south by the Chesapeake Bay.

The topography of the Chesapeake Bay/Coastal Basin varies little. The entire basin lies within the Coastal Plain Physiographic Province where elevations average no more than a few feet above sea level. More significant elevation occurs along the central spine of the Eastern Shore portion, which forms a plateau about 45 feet above sea level. Much of the Chesapeake Bay/Coastal Basin is marshland.

About 30 percent of the Chesapeake Bay/Coastal Basin is forested, while nearly 21.6 percent is in cropland and pasture. Approximately 24 percent is considered urban.

The 1994 population for the Chesapeake Bay/Coastal Basin was approximately 385,716. All or portions of the following jurisdictions lie within the basin: counties -Accomack, Northampton, Matthews, Northumberland, Lancaster, Middlesex, Gloucester, York, and Nansemond; cities - Portsmouth, Norfolk, Chesapeake, Virginia Beach, Hampton and Newport News.

Tributaries in the Chesapeake Bay/Coastal Basin drain into the Chesapeake Bay or the Atlantic Ocean. Major tributaries flowing into the Chesapeake Bay are the Great Wicomico, Piankatank, Fleets Bay, Mobjack Bay, (East, North, Ware, and Severn Rivers) Poquoson, Back River and Lynnhaven which flow from the mainland. Tributaries in the Eastern Shore portion that drain into the Bay are Pocomoke, Onancock, Pungateague, Occohannock, and Nassawadox. Machipongo River, Cat Point Creek, Assawoman Creek, Parker Creek, Folly Creek, and Finney Creek drain directly into the Atlantic Ocean.

### *Citizen Data in the Chesapeake Bay and Small Coastal River Basin*

The Alliance for the Chesapeake Bay has 29 sites in the Atlantic-Small Coastal River Basin. These sites are monitored for pH, dissolved oxygen, temperature, and salinity. This data is included in Appendix B of this report.

The Alliance also performed SAV (submerged aquatic vegetation) nutrient and suspended solids analysis at several sites in this basin.

The Chesapeake Bay/Coastal Basin is divided into seven USGS hydrologic units as follows: HUC 02060009 - Pocomoke River; HUC 02060010 - Chincoteague Bay; HUC 02080101 - Mainstem open bay; HUC 02080102 - Upper Western Shore Tributaries; HUC 02080108 - Lower Western Shore Tributaries; HUC 02080109 - Tributaries on the Eastern Shore which drain to the Chesapeake Bay; and HUC 02080110 - Tributaries on the Eastern Shore which drain to the Atlantic Ocean. The seven hydrologic units are further divided into 31 waterbodies or watersheds.

Basin assessment information is presented in Tables 2.6-7-1, 2.6-7-2, 2.6-7-3.

TABLE 2.6-7-1-A

CHESAPEAKE BAY-SMALL COASTAL BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

**PERCENT METHOD****Total Size Monitored:**

Rivers – 112.72 miles

Lakes - 364.00 acres

Estuaries - 1,539.31 sq. miles

**Basin Size**

Rivers – 733.58 miles

Lakes - 3,205 acres

Estuaries - 1,829 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	429.01	0.96	27.30	21.92	479.19
	Lakes (acres)	2570.47	0	0	0	2570.47
	Estuary (mi <sup>2</sup> )	886.28	705.14	64.87	64.26	1700.55
<b>Fishing</b>	River (mi)	733.58	0	0	0	733.58
	Lakes (acres)	2570.47	0	0	0	2570.47
	Estuary (mi <sup>2</sup> )	1827.37	0	0	0	1827.37
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	1721.52	2.54	36.31	0	1760.37
<b>Swimming</b>	River (mi)	434.66	0	22.39	7.25	464.30
	Lakes (acres)	2570.47	0	0	0	2570.14
	Estuary (mi <sup>2</sup> )	1660.37	0	1.68	0.49	1662.54
<b>Drinking Water</b>	River (mi)	28.00	0	0	0	28.00
	Lakes (acres)	1563.80	0	0	0	1563.80
	Estuary (mi <sup>2</sup> )	1402.00	0.01	0	0	1402.01
<b>DCR-High Priority</b>	River (mi)	0	250.90	0	0	250.90
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	196.16	0	0	196.16
<b>Nutrient Enriched</b>	River (mi)	0	213.37	0	0	213.37
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	1681.53	0	0	1681.53

TABLE 2.6-7-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN CHESAPEAKE BAY - SMALL COASTAL BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	4.69
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Known Toxicity (Ammonia)</b>	River (mi)	1.25
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	11.57
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	36.19
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	144.01
<b>Thermal Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	29.64
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	26.26
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-7-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN CHESAPEAKE BAY-SMALL COASTAL BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	6.52
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.08
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	1.30
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.52
<b>Leaking Storage Tanks</b>	River (mi)	0.46
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	6.22
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	144.01
<b>Source Unknown</b>	River (mi)	39.32
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification (Debris/Bottom Deposits)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Other/Water Quality Standards</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	32.15

TABLE 2.6-7-1-B

CHESAPEAKE BAY-SMALL COASTAL BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

**BINOMIAL METHOD****Total Size Monitored:**

Rivers – 112.72 miles

Lakes – 300.47 acres

Estuaries - 1,539.31 sq. miles

**Basin Size**

Rivers – 733.58 miles

Lakes - 3,205 acres

Estuaries - 1,829 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	417.21	13.50	20.63	24.33	475.67
	Lakes (acres)	2506.47	0	0	0	2506.47
	Estuary (mi <sup>2</sup> )	900.02	701.31	64.37	64.20	1729.90
<b>Fishing</b>	River (mi)	733.58	0	0	0	733.58
	Lakes (acres)	2506.47	0	0	0	2506.47
	Estuary (mi <sup>2</sup> )	1827.37	0	0	0	1827.37
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	1721.52	2.54	36.32	0	1760.38
<b>Swimming</b>	River (mi)	442.94	7.78	15.86	6.00	472.58
	Lakes (acres)	2506.47	0	0	0	2506.47
	Estuary (mi <sup>2</sup> )	1659.37	2.09	0.72	0.36	1662.54
<b>Drinking Water</b>	River (mi)	28.00	0	0	0	28.00
	Lakes (acres)	1563.80	0	0	0	1563.80
	Estuary (mi <sup>2</sup> )	0	0.01	0	0	0.01
<b>DCR-High Priority</b>	River (mi)	0	250.90	0	0	250.90
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	196.16	0	0	196.16
<b>Nutrient Enriched</b>	River (mi)	0	213.17	0	0	213.17
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	1681.53	0	0	1681.53

TABLE 2.6-7-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN CHESAPEAKE BAY- SMALL COASTAL BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	4.69
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	65.66
<b>Known Toxicity (Ammonia)</b>	River (mi)	1.25
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.80
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	2.12
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.50
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	41.38
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	126.82
<b>Thermal Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	24.54
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	36.38
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0



TABLE 2.6-7-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN CHESAPEAKE BAY-SMALL COASTAL BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	1.91
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	113.00
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	113.00
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	1.00
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0.08
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	1.30
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.59
<b>Leaking Storage Tanks</b>	River (mi)	0.46
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	1.62
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	114.25
<b>Source Unknown</b>	River (mi)	43.00
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	5.54
<b>Habitat Modification (Debris/Bottom Deposits)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Nonpoint Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	113.00
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	36.33

## **York River Basin**

The York River Basin lies in the central and eastern section of Virginia and covers 2,662 square miles or 7 percent of the Commonwealth's total area. It is defined by hydrologic boundaries. The basin is bounded by the Rappahannock River Basin to the north and east and the James River Basin to the south and west.

The headwaters of the York River begin in Orange County and flow in a southeasterly direction for approximately 220 miles to its mouth at the Chesapeake Bay. The basin's width varies from five miles at the mouth to 40 miles at its headwaters.

The basin is comprised of the York River and its two major tributaries, the Pamunkey and the Mattaponi. The York River itself is only about 30 miles in length. The Pamunkey River's major tributaries are the North and South Anna Rivers and Little River, while the major Mattaponi tributaries are the Matta, the Po and the Ni Rivers.

Lying in the Piedmont and Coastal Plain physiographic provinces, the basin's topography is characterized by slightly rolling hills at the headwaters or extreme western portion, to gently sloping hills and flat farmland near its mouth. Tributaries in the central Piedmont exhibit moderate and near constant profiles. Streams in the Coastal Plain are largely characterized by their flat slope. Approximately 65 percent of the river basin land is forested. Farmland and pasture accounts for approximately 20 percent of the land area while approximately 10 percent of the river basin land area is urban.

The 1994 population for the York River Basin was approximately 250,332. The majority of the population is rural, evenly distributed throughout the basin. No major cities lie within the basin.

All or portions of the following twelve counties lie within the basin: Caroline, Goochland, Hanover, Louisa, Orange, Spotsylvania, Gloucester, James City, King and Queen, King William, New Kent, and York.

### *Citizen Data in the York River Basin*

There are two organizations monitoring in the York River Basin. In this physiographic region of the state, most citizen monitors choose to evaluate chemical parameters. The York Watershed Council monitored 35 sites in throughout the entire York watershed (estuarine and non-estuarine). Temperature, pH, total nitrogen, total phosphorus and total suspended solids were measured at these sites for a one-year period. The conventional data (temperature and pH) collected by this organization for the yearlong study period indicates few areas of concern in the York River Basin for these two parameters. (Please note that this study focussed on nutrient loads. There are no ambient water quality standards for nutrients.)

The Alliance for the Chesapeake Bay has 32 sites in the York River Basin. These sites are monitored for pH, dissolved oxygen, temperature, and salinity. The data for these sites can be found in Appendix B.

The York River Basin is divided into three USGS hydrologic units as follows: HUC 02080102 - York River Subbasin, HUC 02080105 - Mattaponi River Subbasin; HUC 02080106 and Pamunkey River Subbasin. The three hydrologic units are further divided into 23 waterbodies or watersheds.

Basin assessment information is presented in Tables 2.6-8-1, 2.6-8-2, 2.6-8-3.

TABLE 2.6-8-1-A

## YORK RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

## Total Size Monitored:

Rivers – 786.08 miles

Lakes - 1,509.50 acres

Estuaries - 55.17 sq. miles

## Basin Size

Rivers -3,375 miles

Lakes - 14,633 acres

Estuaries - 94 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	555.81	45.34	46.07	37.75	684.97
	Lakes (acres)	1509.50	0	0	0	1509.50
	Estuary (mi <sup>2</sup> )	63.40	1.43	10.84	3.69	79.36
<b>Fishing</b>	River (mi)	3209.08	10.19	0	0	3219.27
	Lakes (acres)	1509.50	0	0	0	1509.50
	Estuary (mi <sup>2</sup> )	91.98	0.89	0	0	92.87
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	49.55	0.15	13.17	0	78.51
<b>Swimming</b>	River (mi)	376.61	0	94.52	40.69	511.82
	Lakes (acres)	1509.50	0	0	0	1509.50
	Estuary (mi <sup>2</sup> )	79.37	0	1.29	0.03	80.69
<b>Drinking Water</b>	River (mi)	61.33	0	0	0	61.33
	Lakes (acres)	780.20	0	0	0	780.20
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	22.35	0	0	22.35
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	31.69	0	0	31.69
<b>Nutrient Enriched</b>	River (mi)	0	276.64	0	0	276.64
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	72.50	0	0	72.50

TABLE 2.6-8-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN YORK BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	9.92
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	38.16
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.96
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	45.66
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	4.61
<b>Thermal Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	135.21
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	14.01
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-8-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN YORK BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	2.52
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	5.49
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	62.05
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	2.78
<b>Source Unknown</b>	River (mi)	141.82
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	14.19
<b>Habitat Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.17

TABLE 2.6-8-1-B

## YORK RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## BINOMIAL METHOD

**Total Size Monitored:**

Rivers – 504.79 miles

Lakes - 1,509.50 acres

Estuaries - 56.57 sq. miles

**Basin Size**

Rivers -3,375 miles

Lakes - 14,633 acres

Estuaries - 94 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	459.48	68.71	15.22	37.45	580.86
	Lakes (acres)	1509.50	0	0	0	1509.50
	Estuary (mi <sup>2</sup> )	65.17	3.40	10.84	3.69	83.10
<b>Fishing</b>	River (mi)	3205.42	10.19	0	0	3215.61
	Lakes (acres)	1509.50	0	0	0	1509.50
	Estuary (mi <sup>2</sup> )	92.87	0	0	0	92.87
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	49.55	0.15	13.17	0	29.70
<b>Swimming</b>	River (mi)	380.01	43.21	74.69	19.89	517.80
	Lakes (acres)	1509.50	0	0	0	1509.50
	Estuary (mi <sup>2</sup> )	79.37	1.24	0.08	0	80.69
<b>Drinking Water</b>	River (mi)	61.33	0	0	0	61.33
	Lakes (acres)	780.20	0	0	0	780.20
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	22.35	0	0	22.35
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	31.69	0	0	31.69
<b>Nutrient Enriched</b>	River (mi)	0	276.64	0	0	276.64
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	0	72.50	0	0	72.50

TABLE 2.6-8-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN YORK BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	9.92
<b>Unknown Toxicity</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	33.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1.96
<b>Siltation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	18.83
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	4.61
<b>Thermal Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	94.58
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.16
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-8-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN YORK BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	2.52
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Silviculture</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	5.49
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	35.22
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	2.78
<b>Source Unknown</b>	River (mi)	101.19
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.35
<b>Habitat Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Shellfish Condemnation</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	13.16



## **New River Basin**

The New River Basin is located in southwest Virginia and covers 3,070 square miles or approximately 8 percent of the Commonwealth's total land area. The New River flows from its headwaters in Watauga County, North Carolina in a northeasterly direction to Radford, Virginia and then in a northwesterly direction to Glen Lyn, where it exits into West Virginia. There it flows to the confluence of the Gauley River forming the Kanawha River, a tributary to the Ohio River.

The New River Basin in Virginia is defined by both hydrologic and political boundaries. It is bordered by the James River Basin and Roanoke River Basin to the east, and the Big Sandy River Basin and Tennessee River Basin to the west. The southern boundary of the Virginia portion is the North Carolina State line and its northwest boundary is the West Virginia State line.

The New River Basin runs 115 miles in length from Blowing Rock, North Carolina to Bluestone Dam near Hinton, West Virginia with a maximum width of 70 miles near Rural Retreat Virginia. The Virginia portion of the New River Basin is 87 miles in length.

The topography of the New River Basin is generally rugged, the upper reaches of its tributaries being extremely steep. High mountains, narrow valleys and steep ravines characterize the basin. There are ten tributaries in the Upper New River Basin each having more than 100 square miles in drainage area and many others with forty or more square miles.

The New River Basin is the least densely populated of the Commonwealth's major river basins. The higher elevations of the basin have steep slopes and are thickly forested, while the mountain bases are mostly used for agriculture. Approximately 59 percent of its land is forested. Cropland and pasture make up another 35 percent, with approximately 3 percent considered urban.

The 1994 population for the New River Basin was approximately 211,673. All or portions of the following 11 counties lie within the basin: Grayson, Carroll, Smyth, Wythe, Pulaski, Floyd, Montgomery, Tazewell, Bland, Giles, and Craig and the cities of Galax and Radford.

### *Citizen Data in the New River Basin*

The Virginia Save Our Streams program (a program of the Virginia Chapter of the Izaak Walton League of America) has 7 sites in the New River watershed. These sites were all monitored by VA-SOS certified volunteers. The Virginia Tech Museum of Natural History serves as the regional coordinators for VA-SOS monitors in this watershed. This data is included in Appendix B of this report.

The New River Basin is divided into two USGS hydrologic units as follows: HUC 05050001 - Upper New; and HUC 05050002 - Middle New. The two hydrologic units are further divided into 35 waterbodies or watersheds.

Basin assessment information is presented in Tables 2.6-9-1, 2.6-9-2, 2.6-9-3.

TABLE 2.6-9-1-A

## NEW RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## PERCENT METHOD

**Total Size Monitored/:**  
 Rivers – 758.24 miles  
 Lakes – 5,284.50 acres  
 Estuaries - 0 sq. miles

**Basin Size**  
 Rivers - 4,136.72 miles  
 Lakes - 5,284.50 acres  
 Estuaries - 0 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1520.80	156.76	45.51	7.12	1730.19
	Lakes (acres)	1281.50	4003.00	0	0	5284.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Fishing</b>	River (mi)	4136.72	0	0	0	4136.72
	Lakes (acres)	5284.50	0	0	0	5284.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	325.80	0	90.12	47.68	463.60
	Lakes (acres)	5284.50	0	0	0	5284.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Drinking Water</b>	River (mi)	309.50	0	0	0	309.50
	Lakes (acres)	4205.50	0	0	0	4205.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	1174.84	0	0	1174.84
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Nutrient Enriched</b>	River (mi)	0	209.26	0	0	209.26
	Lakes (acres)	0	202.00	0	0	202.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-

TABLE 2.6-9-2-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN NEW BASIN**

**PERCENT METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	22.29
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unknown Toxicity</b>	River (mi)	10.60
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	8.06
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	8.50
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	2.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	10.94
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	137.80
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-9-3-A

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN NEW BASIN**

**PERCENT METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	5.02
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	72.79
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Nonpoint Sources</b>	River (mi)	8.75
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	114.70
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	8.06
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	2.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	10.94
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	16.83
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Collection System Failure</b>	River (mi)	2.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-9-1-B

## NEW RIVER BASIN INDIVIDUAL USE SUPPORT SUMMARY TABLE

## BINOMIAL METHOD

## Total Size Monitored/:

Rivers – 758.24 miles  
 Lakes – 5,082.050 acres  
 Estuaries - 0 sq. miles

## Basin Size

Rivers - 4,136.72 miles  
 Lakes - 5,284.50 acres  
 Estuaries - 0 sq. miles

Use	Water Body Type	Size Fully Supporting	Size Fully Supporting But Threatened	Size Partially Supporting	Size Not Supporting	Total Size Assessed
<b>Aquatic Life</b>	River (mi)	1520.80	168.30	33.67	7.12	1730.19
	Lakes (acres)	1281.50	4003.00	0	0	5284.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Fishing</b>	River (mi)	4136.72	0	0	0	4136.72
	Lakes (acres)	5284.50	0	0	0	5284.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Shellfishing</b>	River (mi)	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Swimming</b>	River (mi)	311.15	72.40	46.27	33.78	463.60
	Lakes (acres)	5284.50	0	0	0	5284.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Drinking Water</b>	River (mi)	309.50	0	0	0	309.50
	Lakes (acres)	4205.50	0	0	0	4205.50
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>DCR-High Priority</b>	River (mi)	0	1174.84	0	0	1174.84
	Lakes (acres)	0	0	0	0	0
	Estuary (mi <sup>2</sup> )	-	-	-	-	-
<b>Nutrient Enriched</b>	River (mi)	0	209.26	0	0	209.26
	Lakes (acres)	0	202.00	0	0	202.00
	Estuary (mi <sup>2</sup> )	-	-	-	-	-

TABLE 2.6-9-2-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS CAUSE  
CATEGORIES IN NEW BASIN**

**BINOMIAL METHOD**

<b>Cause of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>General Standards (Benthic)</b>	River (mi)	21.69
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unknown Toxicity</b>	River (mi)	10.60
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pesticides</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Priority Organics</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Metals</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>PH</b>	River (mi)	8.06
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Siltation</b>	River (mi)	8.50
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Organic Enrichment/Low D.O.</b>	River (mi)	2.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Pathogen Indicators</b>	River (mi)	80.05
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Alterations</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Suspended Solids</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0

TABLE 2.6-9-3-B

**SIZE OF WATERS NOT MEETING DESIGNATED USE BY VARIOUS SOURCE  
CATEGORIES IN NEW BASIN**

**BINOMIAL METHOD**

<b>Source of Not meeting designated use</b>	<b>Type</b>	<b>Total Not meeting designated use</b>
<b>Industrial Point Sources</b>	River (mi)	5.02
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Municipal Point Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflow</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	60.57
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Nonpoint Sources</b>	River (mi)	2.54
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Urban Runoff/Storm Sewers</b>	River (mi)	70.12
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Resource Extraction</b>	River (mi)	8.06
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Land Disposal</b>	River (mi)	2.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Natural Sources</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Source Unknown</b>	River (mi)	3.16
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Habitat Modification</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>VDH Fish Consumption Advisory</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Collection System Failure</b>	River (mi)	2.84
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0